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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MCCALL, ERIC SCOTT

ART UNIT	PAPER NUMBER
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2855

DATE MAILED: 06/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/641,379	SHEN, YUNBIAO	
	Examiner	Art Unit	
	Eric S. McCall	2855	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 12, 13 and 15-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12, 15-17, 19 and 20 is/are allowed.
- 6) ☒ Claim(s) 1-9, 13 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

APPARATUS AND METHOD FOR EVALUATING
FUEL INJECTORS

FINAL OFFICE ACTION

In response to the Applicant's amendment dated April 05, 2006.

CLAIMS

35 U.S.C. § 112

(First Paragraph)

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 3 and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Specifically, the Applicant's originally filed disclosure fails to set forth how combustion in the chamber (217) as claimed takes place.

The Examiner points out that the above rejection was set forth in the previous office action (Jan. 12, 2006) but was not addressed by the Applicant.

(Second Paragraph)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 remains rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention because claim 3 sets forth that "the chamber is a combustion chamber". However, the Applicant's disclosure (paragraph 16) sets forth that the chamber only "simulates" a combustion chamber. Thus, a contradiction exists.

The Applicant has set forth in their disclosure that element 217 is the “chamber” as claimed. Element 217 is clearly not a combustion chamber but instead only simulates a combustion chamber. If element 217 was a combustion chamber in an internal combustion engine, the question would arise as to how and why drain lines (221) would be connected to a combustion chamber as shown in Fig. 2 since such drain lines connected to a combustion chamber do not commonly exist in an internal combustion engine.

In response, the Applicant has argued that the specification clearly supports both a chamber in an apparatus outside an engine as well as being a combustion chamber in an engine. In the case where the chamber is used outside the engine, such drain lines would be present. The Applicant continues on by arguing that in the case where the chamber is the combustion chamber of the engine, the drain lines would not be required and that one having ordinary skill in the art would know how to employ the apparatus using a combustion chamber as the disclosed chamber.

The Examiner disagrees. No evidence is provided in the originally filed disclosure that would suggest that one having ordinary skill in the art would know how to implement the apparatus using an engine’s combustion chamber as the disclosed chamber (217).

For example, the flow meter (223) is critical to the Applicant’s invention. The drain lines (221) supply the flow meter (223). If the drain lines were to be done away with as the Applicant argues would be obvious in the case where the chamber is the engine’s combustion chamber, no mention is made as to how the flow meter would be modified so that the flow can be measured.

In short, if the drain lines were eliminated, the Applicant’s invention as disclosed would be defeated.

The Applicant continues by arguing that when the chamber is the engine's actual combustion chamber, one having ordinary skill in the art would know that such drain lines would not be required because the fuel would combust and no draining would be required. The Examiner points out that if the Applicant's chamber (217) was a combustion chamber that when the fuel combusts and the fuel is gone, not only is nothing left to be drained, but nothing is left to be measured by the flow meter (223). As just one example, the flow meter is disclosed as being a part of the Applicant's invention and the Applicant has simply not suggested in the originally filed disclosure how the drain lines and thus the flow meter would be modified if the chamber (217) was the engine's actual combustion chamber.

The Examiner points out that claim 3 should read --The apparatus of claim 2, wherein the chamber simulates a combustion chamber.--

In view of the Applicant's amendment, the rejection of claim 13 under 35 U.S.C. 112, second paragraph, due to the improper dependency thereof has been overcome.

And, claim 18 remains rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention because the claim contradicts the Applicant's disclosure in that the disclosure never sets forth that the fluid inside the chamber is combusted.

35 U.S.C. § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-4, 7, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Rueger (6,712,047).

With regards to claim 1, Rueger teaches an apparatus comprising:

a fuel injector (1) for an internal combustion engine operably connected to a fluid supply system and having a nozzle disposed at a distal end (bottom of Fig. 1) of the fuel injector, wherein said nozzle has a fluid cavity (area surrounding the needle 11);

at least one discharge port disposed in the nozzle (injector discharge port at the bottom of Fig. 1);

an orifice (passage which contains throttle 8) disposed in the nozzle; and

a pressure sensor (D) adjacent to the orifice, wherein fluid in the fluid cavity is in fluid communication with the pressure sensor, such that the pressure sensor measures fluid pressure.

With regard to claims 2-4, the nozzle of the prior art inherently is mounted to and protrudes into a chamber for the receiving of fluid from the discharge port as claimed because the nozzle of the prior art's fuel injector inherently protrudes into a combustion chamber wherein the combustion chamber receives fluid discharged from the fuel injector via the discharge port.

With regards to claim 7, the prior art inherently teaches the fluid supply system comprising a fluid tank and a fuel pump because the prior art teaching centers around a fuel injection system for an internal combustion engine, and fuel injected internal combustion engines inherently have a fuel tank and a fuel pump for supplying fuel to the fuel injected system.

With regards to claim 8, the prior art suggests a monitoring device attached to the pressure sensor (col. 3, lines 41-46).

Response To Arguments

The Applicant's arguments pertaining to claim 1 have been considered but have not been found to be persuasive. Specifically, the Applicant has argued that the prior art of Rueger does not measure pressure at the nozzle of the fuel injector. The Examiner points out that claim 1 does not require the measurement of pressure at the fuel injector's nozzle. Claim 1 only requires that the orifice be disposed in the nozzle and that the pressure sensor be adjacent to the orifice but does not require the measurement of pressure at the nozzle because the pressure sensor is not required to be in the nozzle. A pressure sensor can be adjacent to the claimed orifice yet not be in the nozzle.

Next, the Applicant argues that orifice, 8, of Rueger is not in the nozzle as claimed but instead in the supply line. The Examiner points out that element 8 was not interpreted as the orifice as argued but instead the orifice was contended to be the passage which contains element 8 and that passage, which itself was interpreted as being an orifice, does extend into, and thus is disposed in, the nozzle as claimed.

35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rueger (6,712,047).

Rueger teaches a pressure sensor (D) but fails to specifically teach the material from which the pressure sensor is made and thus fail to teach the pressure sensor being a piezoelectric quartz transducer as claimed.

Nonetheless, it would have been obvious to one having ordinary skill in the art armed with said teaching to use a piezoelectric quartz transducer pressure sensor as the pressure sensor in the Rueger teaching.

The motivation being that a piezoelectric quartz transducer is a well known and commonly used type of pressure sensor and because of it's reliability and durability would be appropriate for being used in the environment as set forth by the Applicant as suggested by the use of piezoelectrics in the actuator of Rueger.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rueger (6,712,047) in view of Bunch, Jr. et al. (5,000,043).

With regards to claim 5, Rueger fails to teach a pressure control valve as claimed.

However, Bunch, Jr. et al. do teach such a pressure control valve (30).

As a result, it would have been obvious to one having ordinary skill in the art armed with said teachings to include the pressure control valve as taught by Bunch, Jr. et al. with the teaching of Rueger.

The motivation being in order to control the pressure of the chamber for the proper testing of the fuel injector.

With regards to claim 6, Rueger fails to teach a flow-metering unit as claimed, but Bunch, Jr. et al. do teach such a flow-metering unit. Thus, it would have been obvious to one having ordinary skill in the art armed with said teachings to include the flow-metering unit as taught by Bunch, Jr. et al. with the teaching of Rueger.

The motivation being in order to control the pressure and flow of the chamber for the proper testing of the fuel injector.

Allowable Subject Matter

Claims 12, 15-17, 19, and 20 have been found to be allowable over the prior art.

CONCLUSION

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Eric S. McCall whose telephone number is (571) 272-2183.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eric S. McCall
Primary Examiner
A.U. 2855
June 05, 2006

